PATENT APPLICATION

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Application No. 09/680,858

REMARKS

The Applicants have cancelled Claims 1-23 and 25-27 without prejudice in view of the outstanding restriction requirement. The Applicants reserve the right to pursue these cancelled claims in a divisional application. Claim 30 has been amended to delete the redundant term 'microspore.' None of these amendments involve new matter.

112 Rejection, 1st Paragraph – Written Description

Claims 24 and 28-32 have been rejected under 35 USC 112, first paragraph as containing subject matter not described in the Specification. In particular, the Examiner alleges that the Claims should be limited to only the mixed duplex oligonucleotides (hereinafter MDON) specified in the Specification. This rejection is respectfully traversed.

The present Specification teaches generally that any plant gene can be modified with an MDON. One skilled in the art just needs to choose a gene and the modification desired to make the appropriate MDON. Use of the MDON in accordance with the elements of Claims 24 and 28-32 is clearly **TAUGHT**. The specific genes modified in the Specification are **EXEMPLIFICATIONS** of the generic claims. It is clear that there is a written description and teaching in the Specification for Claims 24 and 28-32. Withdrawal of this rejection is respectfully requested.

112 Rejection – Enablement

Claims 24 and 28-32 have been rejected under 35 USC 112, first paragraph for being non-enabling. This rejection is respectfully traversed.

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As argued in the prior section above, the present Specification teaches generally that any gene can be modified with an MDON. Specific genes and the corresponding MDONs used to mutate them are **EXEMPLIFIED** in the Specification. The Applicants read the Hohn et al reference and see on page 8321 the following:

> "....this issue of the *Proceedings* includes two reports describing stable changes in the genome of tobacco and maize after treatment with chimeric oligonucleotides."

While Hohn et al describes the 5' shift of the mutated base in some instances, Hohn et al also describes mutants containing the correctly mutated base. Both may, in certain circumstances, lead to the desired phenotypic trait in the plant.

The Examiner has also cited *In re Wands* as support for this enablement rejection. The Applicants believe that the presently pending claims meet the *Wands* requirements. The present invention relates to plants. Plant science is not like a chemical experiment where reactants are mixed and allowed to react over several minutes, hours or even overnight to obtain a reaction product. The nature of plant science methodology should not result in discrimination to plant science inventions in the Patent Office. The fact that plant science inventions many times include time consuming steps of culturing, transforming, selecting, regenerating, and progeny testing should not be used to reject claims to such inventions as being inherently "non-enabling." As far as one skilled in the art is concerned, the present claims are enabled and would involve mere routine experimentation to identify a gene to be changed and the corresponding MDON to change it.

Hohn et al therefore confirms that the present claims are enabled and one skilled in the art is enabled to practice the present claims under the *Wands* test. Withdrawal of this rejection is respectfully requested.

112 Rejection, 2nd Paragraph – Indefiniteness

The rejection to Claim 30 under 35 USC 112 for being indefinite is deemed moot in view of the amendment made to Claim 30. Withdrawal of the rejection is respectfully requested.

102 Rejection – Hawkes et al

Claims 24 and 28-32 have been rejected under 35 USC 102(a) as being anticipated by Hawkes et al (WO 98/54330). The Examiner incorrectly states that Hawkes et al discloses plant microspores being treated with MDON. This rejection is respectfully traversed.

Hawkes et al describes treating maize **pollen** with MDON. No where does Hawkes et al teach or disclose treating microspores with MDON. Microspores are distinct from pollen. Therefore, Hawkes et al cannot possibly support a 102(a) anticipation rejection of the present claims. Additionally, nothing in Hawkes et al would suggest or teach treating microspores with MDON. The Hawkes et al reference is silent as to whether treating microspores with MDON would likely be successful. Therefore, Hawkes et al cannot support a 103 obviousness rejection of the present claims. Withdrawal of this rejection is respectfully requested.

103(a) Rejection – Kmiec '181 in View of Fennell et al

Claims 24 and 28-32 have been rejected under 35 USC 103(a) for being obvious in view of Kmiec '181 in view of Fennell et al. This rejection is respectfully traversed.

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The Examiner has used Kmiec '181 for teaching the use of MDON to alter plant genes and Fennell et al for teaching the introduction of DNA into plant microspores. While Fennell et al does teach the introduction of DNA ("foreign genes") into microspores, it **CANNOT** support a 103(a) rejection in combination with Kmiec '181 because Fennell et al:

1. did not regenerate corn plants
2. studied only transient expression of expression cassettes (CAT, NOS)
3. used four different constructs with two different promoters
4. used whole gene constructs with regulatory sequences, and
5. did not predict or suggest success of MDON.

The MDON of the present invention are different from the "DNA expression cassettes" of Fennell et al both in (1) size and (2) chemical composition. Fennell et al shed no light on the predictability of MDON and cannot support an obviousness rejection. Withdrawal of this rejection is respectfully requested.

103(a Rejection – Kmiec '181 in View of Saunders et al

Claims 24 and 28-32 have been rejected under 35 USC 103(a) for being obvious in view of Kmiec '181 in view of Saunders et al. This rejection is respectfully traversed.

The Examiner has used Kmiec '181 as teaching the use of MDON to modify plant genes but not specifically microspores. The Examiner has used Saunders et al as teaching the introduction of DNA into pollen grains but the Examiner then unexpectedly equates pollen with microspores. Saunders et al cannot support an obviousness rejection in combination with Kmiec '181 because Saunders et al:

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1. relates to pollen and **NOT** microspores, and

2. used traditional gene expression cassettes and **NOT** MDON.

The MDON of the present invention are different from the "DNA expression cassettes" of Saunders et al both in (1) size and (2) chemical composition. Additionally, Saunders et al used pollen grains and not microspores as required by the presently pending claims. Saunders et al shed no light on the predictability of the use of microspores or the use of MDON and cannot support an obviousness rejection. Withdrawal of this rejection is respectfully requested

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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MENLO PARK OFFICE

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PATENT TRADEMARK OFFICE

Date: February 24, 2003

CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that this AMENDMENT UNDER 37 C.F.R. § 1.111 is being facsimile transmitted to the U.S. Patent and Trademark Office this 24th day of February, 2003.

Thea K. Wagner

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APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Claims 1-23 and 25-27 are canceled.

The claims are amended as follows:

30. (Amended) A mutated plant microspore which comprises ~~**a microspore that has**~~ a genomic mutation wherein the genomic mutation was accomplished by introducing a mixed duplex oligonucleotides into the plant microspore.